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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional): 139081-1/SWA(GERD:0662)

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on July 30, 2007

Signature /Tait R. Swanson/

Typed or printed name Tait R. Swanson

Application Number	Filed
10/722,700	November 25, 2003

First Named Inventor: Loucas Tsakalakos et al.

Art Unit	Examiner
1754	McCracken, Daniel

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

- [ ] applicant/inventor.
- [ ] assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)
- [X] attorney or agent of record. Registration number 48,226.
- [ ] attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____

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July 30, 2007
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

[X] *Total of 1 forms are submitted.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Loucas Tsakalakos et al.	§	
	§	Group Art Unit: 1754
Serial No.: 10/722,700	§	
	§	Examiner: Daniel McCracken
Filed: November 25, 2003	§	
	§	
For: ELONGATED NANO-STRUCTURES AND RELATED DEVICES	§	Atty. Docket: 139081-1/SWA GERD:0662
	§	

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July 30, 2007	/Tait R. Swanson/
Date	Tait R. Swanson

PRE-APPEAL BRIEF REQUEST FOR REVIEW

In respect to the Office Action of May 2, 2007, Appellants respectfully submit this Pre-Appeal Brief Request for Review. This Request is being filed concurrently with a Notice of Appeal.

In the office action mailed on May 2, 2007, the Examiner essentially reiterated the rejection formulated in the previous non-final Office Action. Because the Appellants believe that the rejections are improper, the present Appeal has been filed.

The Examiner rejected claims 30, 32-52, and 54-72 as being unpatentable over 35 U.S.C. §103(a) over Xu (U.S. Patent Number 5,973,444) combined with other references. Of these, claims 30, 38, 44, 54, and 55, are independent.

Independent claims 30 and 38 and claims depending therefrom

The combination of Xu and Linthicum fails to teach a conductive layer that remains after the formation of the nanostructures

Independent claim 30 and 38 recites structures wherein the conductive epitaxial buffer layer remains after formation of the at least one nanorod.

The Xu and Linthicum references, taken alone or in hypothetical combination, fail to teach or suggest the foregoing claim features. *See* previous Response, pages 13-15. In particular, neither Xu nor Linthicum teach employing a structure even remotely similar to the conductive buffer layer that remains after formation of the nanorods. Even assuming the metal catalyst film 87 of FIG. 5D or the metal catalyst film 108 of FIG. 6D of Xu as being equivalent to the conductive epitaxial buffer layer of the present claim, Applicants respectfully submit that the metal catalyst film dissolves into the gate metal during the heating in the process of formation of the nanorods. For example, a passage cited at col. 16, lines 5-10 discloses dissolving of the metal catalyst film during the formation of the nanorods. The cited passage reads:

> [H]eating in an atmosphere containing a carbon source to grow carbon emitters 78 on the exposed substrate inside of the gate openings. During heating, the metal catalyst on top of the gate metal dissolves into the gate metal and does not readily catalyze the formation of carbon fibers on the gate metal.

Therefore, the catalyst film will not remain when the nanorods are formed. In sharp contrast, the present claims recite a conductive epitaxial buffer layer that remains after the formation of the nanorods.

Further, Xu teaches away from having a conductive epitaxial buffer layer that remains until the formation of the nanostructures. *See* previous Response, page 14. Accordingly, even if the field emission device of Xu was hypothetically formed by using the epitaxial buffer layers of Linthicum, the device will not employ a conductive epitaxial buffer layer that remains after the formation of the nanostructures. For this reason, the Xu and Linthicum references, taken alone or in hypothetical combination, cannot support

a *prima facie* case of obviousness of independent claims 30 and 38 and their dependent claims.

Independent claim 44 and claims depending therefrom

The cited references, taken alone or in hypothetical combination, fail to teach or suggest a "conductive platform" such that the conductive platform is independent from catalyst particles as recited by independent claim 44.

Claim 44 recites "a conductive platform, having a top surface, disposed on the top side of the substrate within the cavity, wherein the conductive platform is independent from catalyst particles configured to grow the at least one nanorod."

Applicants respectfully submit that the Examiner is mistaken in considering the catalyst metal film of Xu equivalent to the conductive platform of the present claim. *See* previous Response, pages 16-17. Although Applicants do not intend or suggest that the specification should be read into the claims, the Applicants reiterate that the specification is "the primary basis for construing the claims." *See* Phillips *v. AWH Corp.*, No. 03-1269, -1286, at 13-16 (Fed. Cir. July 12, 2005) (*en banc*). One should rely *heavily* on the written description for guidance as to the meaning of the claims. *See id.* As disclosed in the present application, the conductive platform facilitates the growth of the nanorods. *See* Application, paragraph 47, lines 1-3.

Applicants respectfully submit that Xu does not teach or suggest any structure analogous to the conductive platform as recited in claim 44. In other words, Xu fails to teach or suggest any structure, which is employed to raise the level of nanorods close to the gate opening. The metal catalyst film is used as a catalyst to enhance the growth of the nanostructures. *See* Xu, col. 12, lines 27-33. Therefore, even if the metal catalyst film of Xu may be hypothetically similar to the catalyst particles 404 in the foregoing passage, the metal catalyst film of Xu cannot be equated with the conductive platform recited in the present claim. In view of these passages, the Applicants further note that the present application discloses and claim 44 recites that the "catalyst particles are disposed within a channel" in the conductive platform to facilitate the growth of the

nanostructures, as discussed in a passage in paragraph 47, lines 3-5, of the present application. Xu fails to disclose a conductive platform, and therefore fails to disclose the conductive platform that has catalyst particles disposed within a channel of the conductive platform. The secondary references do not obviate the deficiencies of Xu. Hence, the hypothetical combination of Xu with Linthicum fails to disclose a "conductive platform," as recited by independent claim 44.

Independent claim 54

The cited references, taken alone or in hypothetical combination, fail to teach or suggest "the at least one nanorod extends from a top surface of the polycrystalline conductive diffusion barrier."

Independent claim 54 recites "the at least one nanorod extends from a top surface of the polycrystalline conductive diffusion barrier". As discussed above, the Xu reference discloses a resistive layer rather than a conductive epitaxial buffer layer. Moreover, the Xu reference teaches away from a conductive epitaxial buffer layer. Therefore, Xu also teaches away from employing a polycrystalline conductive diffusion barrier such that one or more nanorods extend from the top surface of the polycrystalline conductive diffusion barrier. The secondary reference fails to overcome the deficiency of the primary reference. For at least these reasons, among others, the Applicants respectfully stress that the Xu and Narayan references, taken alone or in hypothetical combination, cannot support a *prima facie* case of obviousness of independent claim 54.

Independent claim 55

The cited references, taken alone or in hypothetical combination, fail to teach or suggest "the polycrystalline conductive diffusion barrier is configured to inhibit formation of unwanted structures due to interaction between the inorganic substrate and reactants."

Independent claim 55 recites a polycrystalline conductive diffusion barrier "the polycrystalline conductive diffusion barrier is configured to inhibit formation of unwanted structures due to interaction between the inorganic substrate and reactants." As discussed above, Xu reference teaches away from employing a polycrystalline conductive diffusion barrier. Moreover, Xu fails to teach or even suggest a structure equivalent to

the polycrystalline conductive diffusion barrier, such that the structure is configured to inhibit formation of unwanted structures due to interaction between the inorganic substrate and reactants. In a passage cited at paragraph 44, lines 3-10, the present application discloses employing the polycrystalline conductive diffusion barrier to inhibit growth of silicides, etc. The cited passage reads:

> The buffer layer 211 acts as a diffusion barrier and inhibits the formation of unwanted structures, such as silicides, due to interaction between the reactants and the substrate 110. The buffer layer 211 could include, for example, germanium carbide or silicon carbide applied in an epitaxial process, or a polycrystalline diffusion barrier such as W or Ti-W. In some cases the buffer layer 211 should be suitable to support epitaxial growth of the nanostructure materials of interest. In other cases, epitaxy may not be necessary.

Therefore, even if the Xu and Narayan references are hypothetically combined with one another, the result will not be the device of the present claim. Again, for at least these reasons, the Applicants respectfully stress that the Xu and Narayan references, taken alone or in hypothetical combination, cannot support a *prima facie* case of obviousness of independent claim 55.

For all of the above reasons, among others, Appellants respectfully request that the Panel instruct the Examiner to withdraw the outstanding rejections and allow the pending claims.

Respectfully submitted,

Date: July 30, 2007

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